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NEW SPECIES OF GASTERUPTION, TRIGONALYS, PARNOPES AND PSAMMOPHILA.¹

AXEL LEONARD MELANDER AND CHARLES THOMAS BRUES.

GASTERUPTION.

GASTERUPTION (FÆNUS) PATTERSONÆ, sp. nov.

Female.—Length, 11 mm., ovipositor 10 mm. Body ferruginous. Head black. Dorsum of thorax; dorsal line on first abdominal segment, extending nearly to tip of segment; dorsal spots on second and third segments, somewhat indistinct on third; then a dorsal line which widens out, so that it covers the last segment almost completely; piceous. Ovipositor shields very dark fuscous. Legs ferruginous, hind tibiæ slightly darker outwardly and toward apex, and banded with white near base. Clypeus and mandibles ferruginous, the latter black at extreme tip. Palpi rufous, last joint black. Antennæ about as long as head and thorax, fuscous; scape rufous; flagellum black at base and lighter below except on apical joint. Wings hyaline, nervures and stigma fuscous. Head, thorax, and posterior covæ silvery pubescent. Clypeus quadridentate, fringed with golden hairs. Front punctate above antennæ, and very finely and somewhat obsoletely, transversely aciculate. Prothorax rather deeply and finely punctured. Pleuræ rugose; dorsum and metathorax transversely rugose aciculate. Abdomen impunctured, smooth, not very shining; strongly compressed at base, widest at third segment which is one-half as wide as high. Ovipositor longer than abdomen, alutaceous.

Described from a female specimen, collected by Miss Rose Patterson, August 11, 1898, at San José, California.

This species may be readily recognized by the entirely ferruginous pleuræ, legs, and antennal scape and by the very slight amount of black upon the abdomen. It is the only species recorded from California.

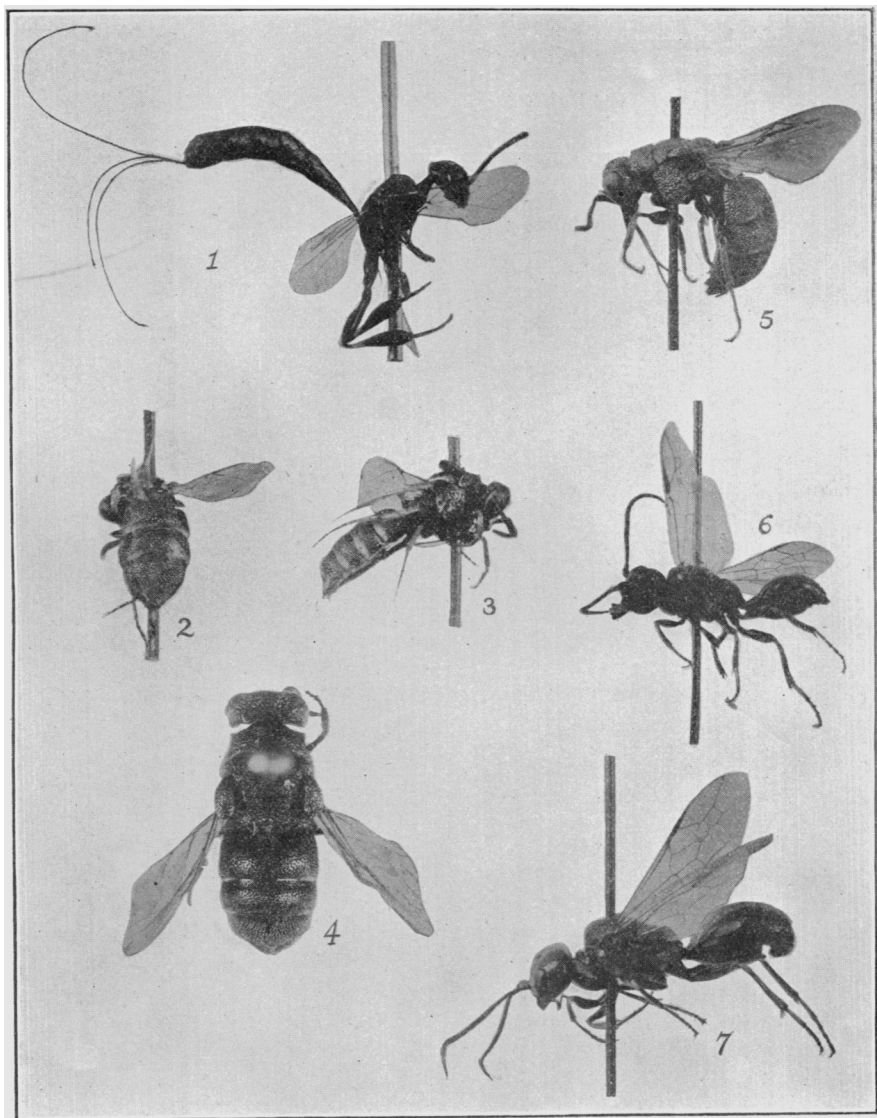
Mr. Ashmead² has pointed out the synonymy of *Fænus* Fabr., and *Gasteruption*, which was described two years previously, viz., in 1796, by Latreille.

TRIGONALYS.

The species of *Trigonalys* from the United States and Canada so far known may be recognized by the following artificial key:

¹ Contributions from the Zoölogical Laboratory of the University of Texas, No. 11.

² Classification of the Ichneumon Flies; *Proceedings United States National Museum*, No. 1206, July, 1900.



EXPLANATION OF PLATE.

FIG. 1. *Gasteruption pattersonæ*, ♀.

FIG. 2. *Parnopes westcottii*, ♀.

FIG. 3. *Parnopes westcottii*, ♂.

FIG. 4. *Parnopes aglaspidula*, ♀.

FIG. 5. *Parnopes aglaspidula*, ♀.

FIG. 6. *Trigonalys hollensis*, ♀.

FIG. 7. *Trigonalys hollensis*, ♂.

All figures are enlarged ; reproduced from photographs made by the authors.

- Insect almost wholly black..... 2
 With conspicuous yellow markings..... 3
 2. Abdominal spots larger ; body less coarsely punctured ; subtegular tubercle black ;
 ♂, 9.5 mm..... *pullatus* Schuck.
 Abdominal spots smaller ; body strongly punctured ; subtegular tubercle yellow ;
 ♂, 11 mm..... *hollensis*, var. nov.
 3. Second abdominal segment fulvous with a large, subquadrate, black spot on each
 side, and a transverse lateral white spot at tip..... *pulchellus* Cress.
 Second abdominal segment black with at least a transverse yellow stripe..... 4
 4. Scutellum wholly yellow ; 7 mm..... *sulcatus* Davis
 Scutellum somewhat black in middle ; larger..... 5
 5. Coxæ and femora black ; wings with subapical cloud..... 6
 Coxæ yellowish, femora dark fuscous ; wings fuscous along costa . *costalis* Cress.
 6. Head confluent punctured..... *nevadensis* Cress.
 Face above antennæ, and vertex impunctate..... *canadensis* Harntgn.

TRIGONALYS PULLATUS Shuck. var. HOLLENSIS, var. nov.

Male.—Length, 11 mm. Black, coarsely punctured, with almost sericeous, short white pile proceeding from each puncture, and covering whole insect. Antennæ with twenty-four joints, black, filiform, slender, the middle joints stouter than the others, the joints evenly decreasing in length to the pointed tip ; scape black. Head strongly, closely punctured ; antennæ inserted in upper portion of transverse broad depression. Mandibles prominent, broad, with three or four well-marked teeth. Maxillary palpi slender, six-jointed ; labial palpi consisting of three stouter joints, the last securiform. Tegulæ piceous ; tubercle below tegulæ yellow. The punctation of the thorax is more rugose than that of head or abdomen. Parapsidal depressions well marked, as is also a central longitudinal groove. Scutellum prominent, with median longitudinal groove, and deeply foveate at sides. Postscutellum strongly fossate at sides. Metathorax rugosely reticulate on posterior declivity. First segment of abdomen short, triangular, second largest, four times length of first, third one half length of second, rest of abdomen incurved, not visible from above, fourth and fifth segments subequal, sixth provided with a rough series of small tubercles. At the apex of the abdomen are two short claspers. Second, third and fourth segments each marked with an inconspicuous yellow lateral spot near posterior margin. First and second ventrals equivalent to first and second dorsals, remaining segments much smaller on account of the infolding of the abdomen : second ventral provided with a subapical, flat, median tooth, beyond which the abdomen is deeply notched ; last ventrals carinate in middle. Legs marked with yellow as follows : exterior faces of all tibiæ, broadly interrupted on middle pair and narrowly on posterior ones, exterior face of front metatarsi, and exterior two thirds of middle and hind metatarsi. Pectus swollen, deeply, longitudinally grooved. Wings hyaline at base, with a slightly infuscated cloud on apical third : subcostal and externo-

medial nervures strong, piceous, remaining veins weaker, interrupted in places; second and third submarginals subequal, second narrowed towards marginal cell, third subquadrate.

Female.—Differs from male as follows: Length, $8\frac{1}{2}$ mm. Antennæ twenty-three-jointed. Second abdominal segment only with a small yellow posterior lateral spot. Abdomen without the secondary sexual characters of the male, shaped much as in *Nomada*, with four genital filaments, the outer pair of which are fimbriate. Four posterior tibiæ with only a basal yellow band, the hind ones with only slight indications of the striping. The second submarginal is longer than the third and subquadrate.

The two specimens were taken at Woods Holl, Mass., during the latter part of July. They had the peculiar habit, noticed in *canadensis* by Dr. Geo. W. Taylor, of alighting on the leaves of low trees.

The stripes of the four anterior tibiæ show a twisting from the knee towards the front. In the male there is also a small basal stripe almost contiguous to the anterior side of the stripe on the hind tibiæ.

Inasmuch as Mr. Shuckard's three-line description of the color markings of *pullatus* can be applied with quite as much certainty to *Oxybelus quadrinotatus* or even to *Eristalis tenax*, it seems advisable at least to redescribe the present form under the name given. Mr. Wm. H. Ashmead writes that he has a specimen of this rare wasp from Minnesota, which in consideration of the type-locality, North Carolina, shows a wide distribution for this species. The differences given in the table between *pullatus* and *hollensis* are not positively stated. The following are the North American species of *Trigonalys* from Mexico northwards.

<i>pullatus</i> Schuckard,	1841,	N. Car., N. J.,	9.5 mm.	♂
<i>costalis</i> Cresson,	1867,	Mass.,	9. "	♂
<i>pulchellus</i> Cresson,	1867,	W. Virginia,	8.8 "	♂
<i>nevadensis</i> Cresson,	1879,	Nevada,	8.8 "	♂, ♀
<i>canadensis</i> Harrington,	1896,	Victoria B. C.	10.5 "	♀
<i>canadensis</i> Harrington,	1898,	Gabriola Is., B.C.	11.4 "	♂
<i>sulcatus</i> Davis,	1897,	New Jersey,	7. "	♂
<i>hollensis</i> n. var.,	1900,	Mass.,	11. "	♂
			8.5 "	♀

PARNOPES.

In 1874 Mr. F. Smith published the description of *Parnopes chrysoprasina* from North Carolina. Since that time no one has found this insect, though the fact that the species of this genus

are widely distributed is not to be doubted. But four North American species have hitherto been known, and these, with the two new species, may be readily identified by use of the following dichotomy :

- | | |
|--|-------------------------------|
| Postscutellum excised | 2 |
| Postscutellum entire | <i>edwardsii</i> Cress. |
| 2. Flagellum black ; legs metallic ; tegulæ green..... | <i>aglaspidula</i> , sp. nov. |
| Flagellum and legs reddish ; tegulæ in part testaceous | 3 |
| 3. Face and metapleuræ bare..... | 4 |
| Face and metapleuræ with silvery pubescence ; wings hyaline..... | 5. |
| 4. More or less bronzed ; tibiæ brown..... | <i>festitus</i> Ckll. |
| Green ; tibiæ with greenish tint | <i>chrysopasina</i> Smith. |
| 5. Postscutellum black, wings hyaline ; abdomen green or bronzed ; 6.5 mm. | |
| | <i>westcottii</i> sp. nov. |
| Postscutellum fulvous ; apex of wings somewhat infuscated ; abdomen bluish ; 9 mm..... | <i>fulvicornis</i> Cam. |

PARNOPES AGLASPIDULA, sp. nov.

Female.—Length, 10 mm. Bright metallic blue-green. Rugosely-closely punctured. Nowhere densely pubescent, but with a few scattered white hairs, more closely placed on sides of posterior margins of abdominal segments. Antennæ piceous, the scape with greenish reflections. Face above antennæ smooth, excavated, with impression of an equilateral triangle the base of which lies between the bases of the antennæ and from the apex of which arises a vertical line passing nearly one half way to the anterior ocellus. In *P. edwardsii* there is no such sculpturing. Occipital punctures confluent. Mandibles rather robust ; black, except for piceous central space. Clypeus concolorous with face, its black apical margin truncate and devoid of hair. Proboscis reaching to first abdominal segment. Thorax with larger punctures than head, the punctures becoming stronger posteriorly. The median prothoracic impression is almost obliterated, as are also the parapsidal grooves. Between the parapsidal grooves the thorax is almost black, likewise the scutellum and postscutellum. Postscutellum with a narrow incision extending about one third the distance into the disc, its sides straight in one specimen and bowed outwardly in the other. Tegulæ narrow, wholly blue-green, with less strongly-marked punctures than thorax. Metathoracic angles prominent, with reticulate markings. Abdominal segments violet-blue on anterior and posterior margins, green in middle portion ; with no apically depressed bands : apical segment with a median carina terminating anteriorly in a narrow, smooth space and posteriorly separating the two subapical oblique grooves, the margin denticulate, with the stronger teeth, about fourteen in number, in a middle series. Venter piceous, smooth. Legs concolorous with body, though gradually lighter in color towards end : knees, apices of tibiæ, and tarsi lighter. Wings infuscated, the veins piceous.

The two females from which the foregoing description was made were taken in Illinois, one in 1897 at Chicago, and the other on August 16, 1899, at Meredosia, in central Illinois, where the fauna and flora are decidedly southern. This is a very distinct species.

PARNOPES WESTCOTTII, sp. nov.

Male.—Length, 7 mm. Bright metallic green varied with coppery reflections. Rugosely punctured. Covered with silvery pubescence as follows: face as far as anterior ocellus densely; metapleuræ densely; sides of scutellum and of postscutellum densely; tegulæ sparsely; suture between prothorax and metathorax sparsely; posterior portions of abdominal segments sparsely, but more densely at the sides; and distal portions of the legs moderately. A few scattered hairs are present on the occiput, thoracic dorsum, coxæ, and femora. Punctures rather irregularly placed, stronger on thorax than on abdomen, confluent behind the ocelli, where they are radially arranged, the rows diverging anteriorly. Antennæ with the scape piceous and flagellum yellowish. Clypeus emarginate, although not so strongly as in *festitus*, yellowish at apex. Mandibles rufous, metallic green at base and black at tip. Proboscis reaching back to the middle of the first abdominal segment. Thorax green, with bronze tint, especially when viewed from in front. Prothorax with a rather well-marked median impression. Tegulæ broad, yellow, disc darker, sparsely punctured. Between the parapsidal grooves the mesonotum is less brilliant. Scutellum and postscutellum piceous, more strongly punctured than the rest of the thorax. Postscutellum excised to nearly its middle, the sinus rounded at the bottom and with a width of about 70 degrees. Sides of postscutellum slightly rounded outwardly. Abdominal segments blue at anterior margin, varying through green and cupreous to piceous on posterior depressed third. This depressed portion is provided with much smaller and confluent punctures, and with the white pubescence parted on the median line. Fourth segment with two wide subapical oblique grooves separated posteriorly, beyond which it is fulvous: its apical margin denticulate, with seventeen teeth in upper rows, below which is a series of lighter colored and more pronounced teeth, the apical two of which are almost spiniform. Venter shining, uniformly fulvous. Legs fulvous, excepting the metallic green coxæ and femora. The trochanters, knees, and upper surface of anterior femora are lighter. Wings hyaline, the nervures testaceous.

Female.—Length, 6.5 mm. Differs from male as follows: Color, a stronger green, with less of the cupreous reflections. Face broader. Scape of antennæ with greenish tinge. Clypeus not so evidently emarginate, black. Mandibles black except rufous spot in middle. Proboscis reaching as far as last abdominal segment. Occipital punctures not radially arranged. Sides of postscutellum, straight. Apical depressed bands of abdominal segments much narrower. The third segment (apical) has

- Petiole much longer, smaller and more slender species8
6. "Wings black, violaceous, dilated part of petiole, second abdominal segment, and anterior border of third, ferruginous" 7 *violaceipennis* St. Farg.
Wings much lighter, petiole black7
7. Petiole short, not extending beyond posterior trochanters, stout species.
2 *grossa* Cress., ♀.
- Petiole extending far beyond trochanters, slender species.
5 *communis* Cress., ♂, ♀.
8. Third submarginal cell small, barrel-shaped, eyes strongly convergent below.
6 *pacifica*, sp. nov.
- Third submarginal not barrel-shaped, eyes only slightly convergent, pubescence often dark6 *communis* Cress., ♂.

PSAMMOPHILA GROSSA Cresson.

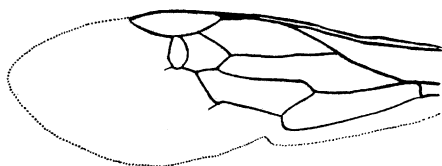
Male.—Length, 22–24 mm. Wholly black, except ferruginous band on mandibles; second abdominal segment below; and narrow bands on third and fourth segments anteriorly above, dilating on the sides and coalescent below; ferruginous; so that second to sixth ventral segments are ferruginous. The dorsal segments also show faint ferruginous bands posteriorly on second to sixth segments, diminishing posteriorly; while in one specimen the black is considerably reduced, until the second and third segments are almost wholly ferruginous. Clypeus and face to considerably above antennæ silvery pubescent. Head, thorax and coxæ bearing long cinereous hairs. Legs white pollinose in certain lights and abdomen slightly so. Clypeus subtruncate, narrowly margined and not dentate; flat below, slightly convex above. Antennæ slightly attenuated toward tip, the apical eight joints each with a sharp carina inwardly. Head very sparsely and rather coarsely punctured. Dorsulum more densely and coarsely punctured. Mesothorax with a short sharp groove anteriorly. Mesopleuræ more densely and coarsely punctate. Metathorax obliquely aciculate on the sides, rugose reticulate dorsally. Legs and abdomen very stout, legs with black spines. Wings light brown, with a violaceous tinge, darker on exterior border. Third submarginal cell oblique, narrowed above. Second submarginal cell receiving the recurrent nervures just before the middle and apex.

Described from two specimens collected at Austin, Texas, during May, 1900.

Although the males differ by their white pubescence from the female described by Cresson, there seems to be no doubt as to their identity, as most specimens of *communis* present the same white pubescence in the males and not in the females. Other specimens of *communis* ♂ collected in Illinois have the pubescence wholly or partially black.

PSAMMOPHILA PACIFICA, sp. nov.

Male.—Length, 12 mm. Black shining, first, second and third abdominal segments bright ferruginous. Clothed with very long pubescence which is white upon the thorax and mixed with black upon the head, especially upon the vertex and face. Head sparsely punctate except around ocelli where it is smooth. Antennæ black, slender, moderately long. Face and clypeus to above antennæ silvery pubescent. Clypeus broadly subtruncate. Mandibles indistinctly annulate with ferruginous. Eyes strongly convergent below, reaching nearly to base of mandibles. Prothorax and mesonotum sparsely coarsely punctured. Pleuræ and sides of metathorax coarsely and densely punctured. Scutellum strongly longitudinally aciculate, the grooves widening out posteriorly to form a row of



FORE-WING OF PSAMMOPHILA PACIFICA.

pits along the posterior margin. Posterior face of metathorax finely transversely aciculate. Coxæ black, clothed with long white hairs which also extend to bases of femora. Tarsi slightly tinged with fuscous, thinly white pollinose. Abdominal petiole black, white pilose anteriorly. Abdomen very slender, first, second and third segments bright ferruginous, remainder shining black. External genital organs fuscous. Their lamellæ with several stiff bristles interiorly and a brush of hairs externally. Anterior wings hyaline, brownish at tip, posterior one hyaline. Marginal cell extending far beyond third submarginal cell, which is less than half as large as the second and barrel-shaped.

Described from a male specimen collected by Miss Rose Patterson at Pacific Grove, California, July 9, 1897.

This species may be readily recognized by the venation of the wings, the strongly convergent eyes, white pubescence and very slender form.

1. <i>P. valida</i> Cress.	21 mm.	Colo.
2. <i>P. grossa</i> Cress.	22–24 mm.	Texas.
3. <i>P. luctuosa</i> Sm.	17 mm.	U. S.
4. <i>P. argentifrons</i> Cress.	13–15 mm.	Colo., N. Mex.
5. <i>P. communis</i> Cress.	12.5–18 mm.	Colo., Ill., N. Mex., Mass.
6. <i>P. pacifica</i> , sp. nov.	12 mm.	Cal.
7. <i>P. (?) violaceipennis</i> St. Farg.	21 mm.	Philadelphia, Pa.